The Source

Newsletter of the NHDES Drinking Water Source Protection Program
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Finding the Gaps in Riparian Buffer Protection Within Water Supply Watersheds

Naturally vegetated riparian buffers are the single most effective protection for New Hampshire's surface waters. Currently a patchwork of state and local protections provide varying levels of buffer protection. Within water supply watersheds there is an estimated 33,500 miles of shoreline frontage. DES has completed a GIS (geographic information system) based "buffer gap analysis" to identify and characterize riparian buffer protection. A major finding of the analysis is that within most water supply watersheds (3 out of 4), more than 40 percent of the shoreline along all streams or lakes is protected.

Protected stream and pond frontage within water supply watersheds

Buffer Protection (Ranked from "High" to "None")	Protected Stream Frontage (%)	Protected Pond Frontage (%)	Total Protected Frontage (%)[1]
1. Land Conservation > 300 ft (High)	24%	6%	21%
2. Land Conservation ≥ 100 ft and ≤ 300 ft (Med-High)	1%	1%	1%
3. CSPA Buffer Protection (150 ft) (Medium)	7%	47%	13%
4. Local Zoning Buffer ≥ 100 ft (Med – Low)	1%	4%	2%
5. Local Zoning Buffer ≥ 50 ft and < 100 ft (Low)	4%	8%	4%
6. No Buffer Protection (None)	63%	34%	59%

[1]*Total Protected Frontage is weighted according to overall stream and pond frontage length.*

The analysis found that most buffer protection within New Hampshire's 55 water supply watersheds (which cover 80 percent of the state's total area) is provided through land conservation adjacent to a stream or pond or the State of New Hampshire Comprehensive Shoreland Protection Act (CSPA). Buffer protection through municipal zoning was found to play a relatively minor role. Buffer protection was classified into 6 different protection classes, ranging from "high protection" to "none" and the percentages of protected stream and pond shoreline frontage within each class are listed in the table above. The results indicate that one-fourth of all stream frontage is protected by land conservation while nearly half of all pond frontage is protected by the CSPA.

With relatively little frontage protected under municipal zoning, this analysis demonstrates that more local planning and zoning can fill existing gaps in riparian buffer protection. Most local ordinances requiring buffers define them to be less than 100 feet and, depending upon soils, slope and/or vegetative cover, a wider buffer distance may be necessary to adequately protect drinking water quality. Other local regulations may be needed to complement a buffer ordinance in order to provide adequate pollutant removal and surface water protection. These additional ordinances include proper stormwater management, protection of steep slopes, and good site design. DES's *Innovative Land Use Techniques* handbook provides information and model ordinances for all of these approaches and more. The handbook is available online at www.des.nh.gov - search for "innovative land use."

DES is using the results from this study to inform the ongoing revision of the DES's Source Water Protection Strategy and the State Water Plan. It is expected that a variety of watershed stakeholders will find the results useful when considering where to strengthen existing protections and fill existing protection gaps. Maps and spatial data are available upon request. To find out more information about this project, contact Pierce Rigrod at (603) 271-0688 or pierce.rigrod@des.nh.gov. •

Watch for information about the spring 2009 Source Protection Workshop. Information will be posted on the DES website. www.des.nh.gov

Spotlight On Pennichuck Water Works: Using Community Based Social Marketing To Reduce Non-Point Source Pollution

Submitted by Stephanie Hanson, Comprehensive Environmental, Inc.

As watershed managers already know, pollution prevention, that is, control of pollution at the source, is more permanent and less costly than "end of pipe" treatment. Simply providing information to residents doesn't necessarily lead to widespread adoption of pollution prevention measures. Community Based Social Marketing (CBSM) is a more effective approach because it draws on research in the social sciences to identify a variety of effective "tools" for promoting more sustainable behavior change. To this end, Comprehensive Environmental, Inc. (CEI) has been contracted by Pennichuck Water Works to initiate CBSM in the Stump Pond watershed that provides recharge to Pennichuck Brook, a surface water source for the city of Nashua.

A top priority for Pennichuck Water Works is to reduce high levels of phosphorus found in the surface water within the Stump Pond watershed. CEI is using CBSM to encourage more residents to adopt pollution prevention measures related to fertilizers, pet wastes, and yard waste disposal. The first step was to collect information concerning current resident behavior. A survey was distributed to 600 homes in the watershed to identify positive and negative yard and pet management practices that were already occurring and to identify any barriers to adopting better practices. Survey results indicate a high number of people regularly apply fertilizers but few conduct soil tests. These results indicate that there is an opportunity to decrease the overall use of fertilizers by applying them properly (e.g. only as needed). Specific barriers indentified by the survey include a lack of understanding of fertilizer types and lack of soil testing.

In 2009, certain CBSM techniques will be used to promote the proper use of lawn fertilizers including obtaining personal commitments, providing regular reminders/prompts, establishing "norms" for soil testing and fertilization, creating incentives, and providing training to residents through personal contact and group workshops. A follow-up survey will be distributed after implementing these techniques to help evaluate the effectiveness of the CBSM program and determine what follow-up action might be necessary.

With a better understanding of why residents choose certain behaviors, as well as the barriers to selecting more environmentally sustainable behaviors, Pennichuck Water Works will be in a better position to continue to use CBSM techniques to minimize behaviors associated with the release of phosphorus in the watershed. If you have any questions or would like further information about this project, contact Stephanie Hanson at Comprehensive Environmental, Inc. at (603) 424-8444 or shanson@ceiengineers.com. ●

Lake Management Plan "How-To" Guidance Document Available

The DES Lakes Management and Protection Program (LMPP) in cooperation with the Lakes Management Advisory Committee and the NH Office of Energy and Planning have recently developed *The New Hampshire Guidelines for Coordinated Lake Management and Shoreland Protection Plans*. The document was developed in compliance with RSA 483-A and includes the elements and issues of lake management that the legislature stipulated to be included in a lake management plan.

The purpose of the guidelines is to provide municipalities, lake associations, volunteers, and others with the information they need to develop and execute lake and watershed management plans at the grassroots level. By developing a lake management plan, groups can increase awareness and promote environmentally responsible use of the water and land resources within their watershed.

Developing a lake management plan can be a significant undertaking requiring a great deal of information; some that already exists and is available and some that needs to be generated. With that in mind, the LMPP developed a complementary document, the *Comprehensive Lake Inventory* to help groups collect the relevant and appropriate information which should be used for a management plan. Both documents are available on the LMPP website at www.des.nh.gov. In the A to Z List, choose

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Rock Blasting BMPs to Protect Water Resources

The blasting of rock associated with land development, road construction, or mining projects in some instances may alter water quality or water levels in a localized area around the blasting site. When there are private or public water supply wells nearby, it is especially important to prevent and monitor impacts to groundwater.

The occurrence of large-scale rock blasting associated with land uses in close proximity drinking water wells is becoming more commonplace. This may be because the most suitable building sites have already been developed, driving newer projects to occur on properties that require substantial land alteration. Another possible cause is that recent improvements in mobile rock crushing technology have made site development at these marginal sites more technically and financially feasible. Also, existing mining sites seeking to expand may find that new housing developments have been constructed close to the area in which the expansion is to occur.

To assist with this growing concern, DES has developed a draft document to provide guidance on the types of measures and monitoring that can be implemented when rock blasting is going to occur near drinking water supply wells. The document, *Potential Impacts of Blasting on Water Supply Wells Constructed in Crystalline Bedrock and Measures That Can be Implemented to Prevent or Mitigate These Impacts*, also summarizes the legal authority municipalities and the State have relative to rock blasting and the protection of groundwater. The draft document is available for public review and comment through January 16, 2009.

If you are interested in reviewing and commenting on the draft document, contact Brandon Kernen at (603) 271-0660 or brandon.kernen@des.nh.gov. •

DES's New Stormwater Management Manual

The New Hampshire Department of Environmental Services will soon release the *New Hampshire Stormwater Management Manual*. The manual will help the regulated community (i.e., permit applicants, developers) and municipalities deal with more stringent state and federal stormwater regulations, and promote a shift from conventional to more innovative stormwater management strategies. The manual will be issued as a three volume set and is consistent with state permitting requirements: 1) Stormwater and Antidegradation; 2) Selecting and Designing Post-Construction Best Management Practices; and 3) Erosion and Sediment Control Practices During Construction. The *New Hampshire Stormwater Management Manual* will be available on the DES website by January 2009. For more information please contact Jillian McCarthy at (603) 271-8475 or at jillian.mccarthy@des.nh.gov. •

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"Lakes," then scroll to "Publications".

For more information on the guidelines or the inventory, contact Jacquie Colburn at (603) 271-2959 or via email at jacquie.colburn@des.nh.gov.

Local Source Water Protection Grants are a possible funding source for developing and/or implementing lake management plans for public water supply sources. For more information on Local Source Water Protection Grants, contact Johnna McKenna at (603) 271-7017 or johnna.mckenna@des.nh.gov. •

Water Use Registration and Reporting Rules

Measuring water use (short and long-term trends) is essential to better manage water resources within our state's watersheds and aquifers. To acquire this valuable data, DES requires water use information from any person or facility that withdraws or discharges a cumulative amount of more than 20,000 gallons of water per day averaged over any 7-day period to register, measure, and report water use. In September, DES adopted Env-Wq 2102 *Water Use Registration and Reporting Rules*, which require each withdrawal, discharge, or transfer of water to be individually measured. Water meters and weirs are the default measurement method for pipeflow and open channel flow, respectively. Although alternative measurement techniques are allowed, they are not readily accepted and measurement accuracy needs to be demonstrated to be within 10 percent of the actual flow. These rules also describe the information required for registration, set accuracy standards for water use measurement, and define the frequency with which water use must be reported.

To date, nearly 700 facilities, with almost 1,300 sources and over 500 destinations of water, are registered with DES. Registered users comprise all sectors of water use including public water supply, golf course irrigation, snowmaking, power production, bottled/bulk water, industrial/commercial facilities, and agricultural users.

For additional information or questions about the program, please call Derek Bennett at (603) 271-6685 or derek.bennett@des.nh.gov. A copy of the recently adopted rules may be obtained at www.des.nh.gov. Choose "Rules/Regulatory" under the Quick Links and scroll to Env-Wq 2102 towards the bottom of the page. •

Unused Medication Management and Disposal Options

How unused medications are managed and disposed of is an important issue for New Hampshire to address. Improper management or regulatory barriers can result in the release of these substances to our water resources, or result in drug abuse or unintentional drug poisoning.

DES has developed a summary document on this topic that describes:

- Medication use trends in the United States and New Hampshire.
- Legal issues affecting how unused medications may be collected and disposed.
- Potential health and environmental issues associated with releasing medications to solid waste facilities and wastewater disposal systems.
- Typical disposal and reuse practices in New Hampshire at long-term health care facilities and personal residences.
- Options for managing unused medications in New Hampshire.

While the majority of medications are believed to be introduced to the environment by passing through the bodies of humans and animals, some of the medications that are being detected are the result of disposing (e.g., flushing) unused medication into public or private wastewater systems. Studies have estimated that 35 percent of all unused medications in a residential setting are disposed of in a wastewater system. Studies have also shown that long-term health care facilities typically dispose of all unused medications into wastewater systems due to regulatory barriers or costs associated with utilizing alternative disposal methods.

DES will be distributing a document on unused medication disposal options to the medical community, pharmaceutical manufacturers, community organizations, municipal officials, and state and federal agencies for review and comment. The goal of this effort is to organize the work of the various stakeholders to develop effective approaches and outreach initiatives to safely dispose of unused medications.

If you are interested in obtaining a copy of this document or participating in this work group, contact Brandon Kernen at (603) 271-0660 or brandon.kernen@des.nh.gov. •

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